

# Intermontanus

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## CONFESSIONS OF AN ALTERNA ADDICT: THE CARE AND BREEDING OF THE GRAY-BANDED KINGSNAKE. PART 1

Joel Eidbo

When I was younger, my idea of a good time was hunting garter snakes on the Buffalo River. They were easy to maintain and it was fun watching them catch goldfish. It was at the pet store, while buying some goldfish, that I first discovered the Conant field guide. After buying it, I learned about a whole rainbow of snakes, none of which seemed to occur in northern Minnesota. The most impressive snake to me at the time was the humble corn snake, and soon my lawn-mowing cash bought the first of what was to become a procession of rat snakes. Even though I later fell in love with the gray-banded kingsnake (*Lampropeltis alterna*), you never forget your first love, and I still keep a few corn snakes, even after 20 years.

It was during college when I stumbled across the Audubon field guide. I can remember, like a religious experience, the first time I saw the photos of the gray-banded kingsnake; it was love at first sight. Instantly, I was a brand-new member of "Alternas Anonymous", but too broke to do anything about it. I spent long hours in the many college libraries of my town, searching for anything written about this fabulous snake. Finally in 1982, using student loan money, I scored my first *alterna*, a beautiful hatchling from California. Later, an adult pair followed, and with the marvelous ignorance of beginner's luck, I was able to successfully breed them. In terms of my addiction, it's been downhill ever since, and now I tend a colony of about 50 gray-bands of various sizes, ages, and patterns. Through the years I've learned a lot about these challenging snakes (often the hard way), and hope to pass on some of my hard-earned experience to other *alterna*.

Gray-banded kingsnakes, *Lampropeltis alterna*, are almost a cult-like totem, and sometimes the hatching of a favored clutch of eggs is a celebration unlike anything since the Minnesota Twins won the world series. Another transcendent joy is to capture one in the wild. No other snake generates such excitement in the wild; unless you're being chased by an angry cobra. In southwestern Texas, dedicated alternophiles stalk their prey until the wee hours of the morning. Like prospecting for gold, the crazed hunter patiently sifts rock cut after rock cut, searching for signs that will lead to the mother lode. I can't begin to describe the excitement of spotting a gray-band in the wild; I'm no expert at hunting snakes outdoors (although I have many good stories about hunting them in the home). Some of my friends are experienced veterans and they are much better equipped to describe the details of wild-collecting. I leave it to them to write about hunting grays (and I hope one of them will).

A couple of times, a friend of mine has taken me out night-hunting on the roads of west Texas. With blazing spotlight and caffeine-dilated bloodshot eyes, we've cruised up and down stretches of the highway, nights at a time, scanning the cuts and crevices of the sheer rock walls. I spotted a couple, while my friend spotted three or four that I missed. When you hold that first catch in your hands, eyeing it in the headlights, the feeling is indescribable. I have only hunted a few nights, while my friends have hunted hundreds. Don't 1539 Leslie Road, Meadville, PA 16335-8469, USA

• Due to the length of Joel Eidbo's article on Gray-banded kingsnakes the usual sections for announcements and new publications have been omitted from this issue.

get the idea it's easy; you might hunt for days and never see an *alterna*, and most of the ones you find are males.

Hand-in-hand with wild collecting is the concept of locality. Gray-banded kingsnakes have a remarkably variable pattern which varies by locality. Some of the more grizzled collectors seem to be able to look at a specimen, and tell you what rock you found it under. Well, maybe not that accurately, but certain localities appear to have unique characteristics. Many gray-band breeders will match up their animals so they can breed a pair that both came from Loma Alta, or Juno Road, or the Christmas Mountains, or a number of other specific locations. In some of these locations, gray-banded kingsnakes are so rare that only one has been found, and a full pair does not yet exist in captivity. In other cases, maybe only a single female is in the hands of a collector. The offspring from rare locality gray-bands can be very expensive!

After talking with fellow gray-band addicts on the floor of a rundown Del Rio motel room at three in the morning, it struck me that like a lot of pursuits, there's as much fun in the hunting, as there is in the finding. Sometimes they would discuss the idea of the ultimate gray-band; some would say finding an albino, someone else would say a gravid female from some rare locality. I would sit there smiling and if asked, "what is your idea of an ultimate gray-band," I would answer, "all of them are!" To paraphrase Will Rogers, I never met an *alterna* I didn't like.

Controversy surrounds the collecting of gray-bands. The Feds apparently determined that road collecting seriously depletes the native population, and decided to round up some of these vile outlaws. If you read about it in Time Magazine, you would have thought they caught somebody praying in school. Anyway, they pulled a sting operation, and apparently issued a few tickets. Gray-bands everywhere can sleep soundly tonight. My take on these sting operations is one of amazement: a few hours away, in Sweetwater, Texas, they can legally (and blatantly illegally) capture and slaughter rattlesnakes by the ton, and have their picture taken with the local sheriff. But by golly, shine a spotlight on a deserted road in west Texas, where you are surrounded by thousands of square miles of uninterrupted habitat, and the government spends millions to nail you. I think the roads to west Texas could be bumper-to-bumper with rabid collectors, 24 hours a day, 365 days a year, and there would be no significant effect on the native population. Yeah, but what do I know - I have to work for a living.

Only when you hold a living gray-banded kingsnake in your hands will you understand why so many of us are hooked. As individual as snowflakes, and as beautiful as autumn leaves, trying to generalize a description of the appearance of gray-bands is kind of insulting. So pardon me, but briefly, gray-bands are either light-phase or dark, and have either an *alterna* or *blairs* pattern. Thus, there are four basic types: light *blairs* (Fig. 1), light *alterna* (Fig. 2), dark *blairs* (Fig. 3), and dark *alterna*. Light phase animals have a light gray to bluish to almost white background color. Individual scales may or may not be edged in black. Dark phase snakes have a medium to dark gray background that sometimes is charcoal black. In fact, there are breeders working on entirely black gray-bands, so called

melanistic alternas. *Alterna* phase refers to gray-bands with very narrow dorsal saddles usually only a few scales wide. These bands may or may not contain orange, although the most desirable *alterna*-phase is one with the narrowest bands, lacking any orange at all. Between the saddles are rows of spots or 'alternates'. The alternates may be spread evenly down the entire snake, or may appear at random. Sometimes the spots between bands are so numerous that the snake appears to have a leopard-like pattern. The blairs phase is the easily recognizable one, having bright orange dorsal saddles. The width of the saddles varies; I have seen examples of grays with almost 80% of their dorsal surface bright orange. The quality of the orange is extremely variable as well, ranging from a lifeless, brownish-orange, to scarlet red, to brilliant fluorescent orange that makes your fillings hurt. The orange is sometimes obscured by suffusion with black, to the point where the saddles appear to be black bands with some orange peeking through. The orange or red color may be bright or dull, and uniform or spotty, where the band resembles a starburst or sunspot. Even the number of bands is variable from 10 or 12 to over 20. Black and white photos can't begin to do justice to *blairi*, but Figs. 1-3 illustrate what I'm talking about.

There are two ways to get a gray-band, catch one, or buy one. It's a lot more fun to catch your own, but if you add up the money you spend on food, gas, motels, and travel, just to have the opportunity to try and catch one, you will soon realize it's much cheaper to just buy one. I have a few wild-caught *alterna* in my collection, animals I purchased from other collectors. Initially they are more sensitive and finicky than captive born animals. One male I had for several years always refused mice when first brought out of hibernation; he would take lizards first, then switch back to mice. Wild-caughts seem more aware of seasonal changes as well. My wild caught gray-bands are always the first to go off feed in the fall. I managed to kill a couple of males through starvation before I understood this. Now I adjust my hibernation schedule accordingly.

Choosing a gray-band can be a tough decision. Wild-caught animals can be more difficult to get started, and for most of us, it's unlikely that we will be able to collect what we want. You could also buy a wild-caught animal, as I have, but with all the captive breeding today, I would suggest buying a captive bred animal.

Hatchlings can be purchased from wild-caught parents of known locality, which is the best of both worlds. Such a hatchling should be easier to acclimate than wild-caught, and still has a documented locality. Prices vary from \$50 to \$500, depending on locality, looks, size, sex, etc.

Decide if you want a hatchling or an adult, or something in-between. Ask yourself: why would anyone sell an adult *alterna*? Good question. Many of the adults I have purchased were not healthy, would not feed, were way older than reported, were uglier

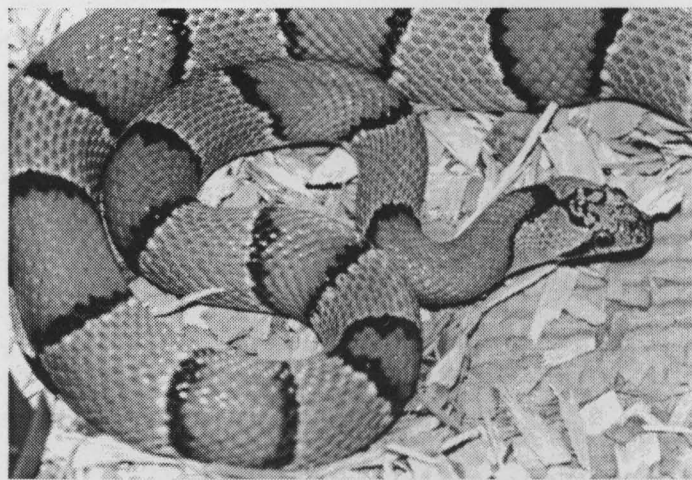


Fig. 1. Light 'Blair's' phase of *Lamppropeltis alterna*

than described, had injuries or illness, or were the wrong sex.

If you want to buy an adult, do these things, if possible. First, get a guarantee of gender; I can't remember how many male *alternas* have been sold to me as females. Get pictures of the animal for sale. Ask for feeding records, and breeding history. Find out the animals age and general health. Any history of egg-binding, or visits to the vet? If it's a male, is it a dud stud? If the deal sounds too good to be true, it is! If you can't get a guarantee of a healthy feeding snake, don't buy it. Don't buy any snake unless you know the person selling it, and have a money-back guarantee if you don't like the animal. To me, there are just too many unknowns in buying an adult snake.

It's usually better to buy a hatchling or yearling. Such a young animal has no bad history to hide, and you can be sure of its age. Hatchlings can be "popped" to determine sex, and yearlings can be probed. Once again, before buying, make sure the snake is feeding on unscented mice. Get a guarantee of gender. If it's a yearling, don't buy a runt. I have seen snakes no larger than a hatchling sold as yearlings, that obviously hadn't been eating very well.

Here's a helpful hint for everyone who is first buying an *alterna*. Ask the breeder for a deal on a couple of extra males. Generally speaking, more males than females are hatched out every year, and I am always happy to sell off extra males. Novices will often have difficulty in raising their first gray-bands; if they can buy a couple of males and save a little money, then if one should die, they're not out as much money.

Overall, I think yearling gray-bands are the best bet. The first year is the hardest, and if they make it through, they are usually well established. Obviously, it is much harder to find yearlings for sale, because most of us will keep them for our own breeding. If yearlings are available, often, at least in my case, it is because of thinning out. This is the time when I evaluate my *alterna*, and winnow-out the ones I don't intend to add to my breeding program. Not because they are sick, or won't eat, and maybe not even because they aren't as pretty as the rest. One year, I held back 17 hatchlings, of which 14 made it to the yearling stage. I didn't have the cage space for all 14, so I sold off 6. The person who purchased them was quite pleased with the animals, all of which have continued to do well.

A yearling should have enough body weight to easily tolerate the

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stress of travel to its new home. A yearling also should have a well developed pattern, and you can tell if it is going to be a light or dark phase by now (this is one of the reasons I wait for a year before thinning out my hold-backs). Yearlings are harder to find, and may cost more, but you can avoid some of the headaches of raising a hatchling and get a year's jump on breeding at the same time.

Once the snake is in your possession, there are many steps you should take. First, get the animal probed or popped, and make sure it's the right sex. A guarantee of gender isn't much good a year later. Second, quarantine the snake and carefully inspect it; be on the lookout for ticks, mites, spinal kinks, injuries such as bite marks, hunger folds, evidence of respiratory or other illness, or mouth-rot. If the snake fails the exam, return it and get your money back. If it passes, move on to the next level.

While still quarantined, check the stool, if it's loose and runny, full of mucous, abnormal in color, or unusually foul-smelling, send it back. If the stool is okay, then observe the animal. Is it moving around, acting like a normal, active snake? Or is it lying in the corner like a limp noodle? Muscle tone is a good indicator of overall health, and lack of it is an equally good indication of poor health. Last, of course, is try and feed it. Only when the snake passes through all these checks, and feeds readily, should you accept the snake. Even now, though, there is no guarantee that the snake will do well. That's up to you.

Congratulations! You are the proud owner of a gray-banded kingsnake! After staring at it for a few hours, after counting the number of bands and alternates, after smugly boasting to all in earshot that you scored, and after you come to your senses (if *alterna* addicts ever do), now is when you realize you need a cage to keep it in. How many herp nuts do you know that spend thousands on their animals, and almost nothing on their cages? I guess it's like candy-nobody wants to spend anything on the wrapper.

After I bought my first *alterna*, I wanted to place it in a captive environment that would replicate its native habitat, like a miniature ecosystem: rocks, sand, live plants, lighting, and of course a large amount of floor space for the snake to roam around in. One quick look at my wallet, and I realized most of my money had gone into buying the snake. I couldn't afford those large impressive enclosures, I had to settle for an efficiency apartment approach. Although the snake seemed cramped, it thrived. Only later, after years of keeping gray-bands, did I realize that too much space is not a good thing, especially if there isn't sufficient hiding area. Compared to then, nowadays many different housing options exist. Your choice is limited only by your wallet, your imagination, or your wife (at least in my case).

My first cages were simple wood boxes, with a front window, and insides lined with linoleum. They were pretty cheap, but well made and attractive. Trouble was, they were practically air tight, and prone to excessive humidity. Water was always condensing on the walls, soaking the substrate and eventually the snake. I switched to simple glass aquaria; a lot of people still use them, but I think the openness of glass all around is a disadvantage, especially for a relatively secretive snake like the gray-band. I would tape dark paper around the sides of my aquaria, leaving only the front pane and the top exposed. Even aquarium tanks became passé, when I discovered plastic "shoeboxes." At first, the only kind I knew of were the clear hard plastic type, the kind that break easily. Still, they were easy to clean, lightweight, cheap, and you could stack up unused boxes in a minimum of space. The hard plastic boxes were

not large enough for adult *alterna*, however, and I was always chipping the corners every time I went to clean them.

For at least five years, I have been happy with Rubbermaid plastic boxes. Rubbermaid's are made of a durable, and flexible plastic, and are available in many sizes. The plastic is not perfectly clear, but slightly opaque. The opacity is an advantage when keeping gray-bands. Three common sizes are used, known in the vernacular as "shoeboxes", "sweaterboxes", and "blanketboxes." Shoeboxes are 33 cm long x 20 wide x 8.5 high. They are the ideal size for raising hatchling gray-bands. Sweater boxes are 40 cm long x 27 wide x 15 high, and serve perfectly for yearling to young adult gray-bands. Finally, blanket boxes measure 57 cm long x 41 wide x 15 high, and have ample floor space for even the largest *alterna*. Rubbermaid produces both the sweater and blanket box sizes with different heights. If you feel the heights I use are too confining, choose boxes that are a little taller. Ventilation is easily accomplished by drilling or melting holes all around the perimeter just beneath the rim. There are other soft plastic boxes besides Rubbermaid, but I have tried several, and none seem to be as tough as Rubbermaid's and none are as easy to find.

Advantages of soft plastic boxes are many: they are cheap, easy to clean, durable, secure for the snake, and easy to incorporate in a rack system. When kept in a rack enclosure, you do away with the lids. Each tub is securely snuggled in its own compartment, and slides out easily. The top of the compartment serves as a lid. Rack housing is as escape-proof an environment as anything I have ever used. If you manage to pull out a box and forget to slide it back in, the unused lids can serve a new function. Place a vertical stack of lids in a corner of the snake room. On the few occasions when a snake has gotten loose, I have always found them coiled up between a couple of the lids. I think the lids act like rock layers and remind them of home.

Some breeder's have enclosures consisting of an upper compartment similar to the standard square box cage with the front window, and a lower compartment consisting of a simple drawer. These drawer type cages are perhaps the best possible combination of

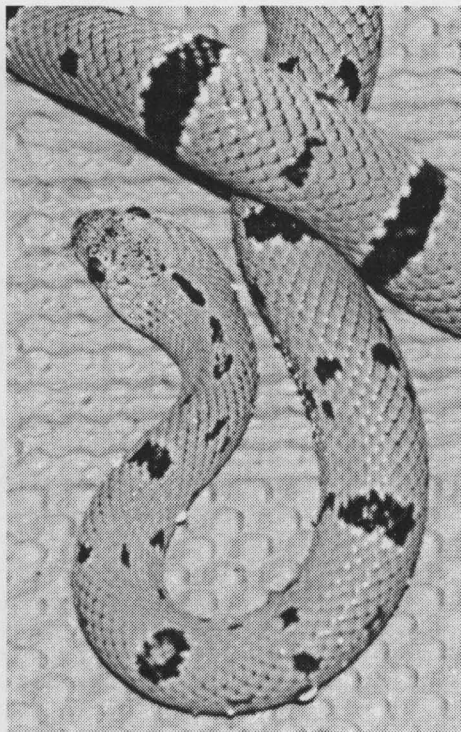


Fig.2. Light "alterna" phase of *L. alterna*.

other types; the upper compartment allows easy visibility of the snake, as well as lighting if desired, while the lower drawer gives the snake a large hiding place for security. The compartments are connected by a short segment of PVC pipe through a hole in the floor of the upper space. The drawer can be slid out like a rubbermaid tub (the drawer could actually be a rubbermaid tub) for easy cleaning. In the future when I'm rich and famous, or at least rich, I would like to have a series of these drawer style cages.

Both the rack and the drawer systems are now commercially available, but they can be quite expensive. If you are limited by space, the plastic rubbermaid rack systems are the most space-efficient, and less expensive than the two compartment drawer style racks.

No matter how you house your gray-bands, temperature control is important for maintaining and successfully breeding them. Commonly, flexible heating tape is used, either the flat ribbon style, or the newer flex-watt type. Either works well. The heat tape is controlled by a thermostat, using anything from a simple dimmer switch arrangement, to high tech digital electronic thermostats. Personally, I have used various Microclimate brand thermostats for years, but friends of mine report equal success with many of the other brands. If you have enough cages to require more than a few feet of heat tape, it's a good idea to use several smaller tapes each

with its own thermostat, instead of trying to control the entire assembly with one tape.

Remember physics; heat rises! If the heat tapes are all hooked up to one thermostat, put the probe in a cage towards the top of the rack. If it is put in the bottom, the upper cages may overheat. To offset this potential problem, I have three heat-tapes, one each for the upper, middle, and lower third. Each tape has its own thermostat. The probe from each is fixed into place on the cage floor, underneath the substrate, immediately above the heat tape. Each thermostat is set to control the warmest temperature in the cage. The lower thermostat is set slightly higher than the middle, and higher still from the upper thermostat. After a little fine tuning, the hot-spot temperature in my lowest cage is within 1 degree of my highest cage.

The rack system I use predates flex-watt style tape, and is fitted for the thinner ribbon style. Because ribbon tape is only about 3/4" wide, it doesn't disperse the heat very well. To correct this, try covering over the ribbon with a layer of adhesive aluminum tape. Much like aluminum foil, the tape conducts the heat over a wider area, about 3", and also covers over the heat-tape, decreasing any fire hazard. Ribbon-tapes are about 1/4" thick, so they are fitted into a 3/4" routed groove in the back of each shelf. The groove is then covered with the aluminum tape. The bottom of each shelf on the rack is smooth, and there is no resistance felt when pulling out one of the boxes.

Put heating elements on the bottom, to allow the heat to rise. By heating the floor of each cage, the belly of the snake is warmed first, which aids digestion, and also basking in pregnant females. You will always know if the temperature is too warm over the heat-tape, because all the snakes will be seen at the front of the cages. Using heat tape in the floor of the rack creates a temperature range from back to front. I prefer to use temperature gradients rather than heating the entire cage to a uniform temperature. A constant temperature is not natural, and if it gets too hot, the snake has no place to escape. Many breeders are concerned about higher temperatures causing sterility in males; I don't know of any studies that prove it, but I think if you provide a temperature range in a large enough enclosure, the snake, male or female will be able to thermoregulate itself adequately.

Verifying temperatures is still an inexact science. It isn't a good idea to rely on the settings of the thermostat. An independent measurement of the cage temperature is prudent insurance in case of a thermostat failure. Of course this means checking thermometers every day. Everybody swears by the cheap digital thermometers, like the kind at Radio Shack for 15 bucks. Most of these are not too reliable. For example, I set three identical models in the same place, with their sensors resting on the exact same spot. I got three different temperatures, with a difference in readings of up to 4°F. Not only do individual thermometers differ from each other, but from themselves as well. To assess overall and general conditions, the inexpensive digital thermometers are okay. But if an exact reading is needed, use a mercury thermometer (the glass kind from science lab), or the more costly laboratory grade digital models. Even though I still use the Radio Shack specials, I back them up with equally cheap mercury thermometers from the pet stores (used in fish tanks), with one expensive lab-style mercury thermometer. After setting up the

racks, thermostats, and thermometers, take the time to fine-tune everything to before the snakes are moved in.

After everything is set, the next obvious question is "what's the best temperature for gray-banded kingsnakes?"

There seems to be as many answers as there are gray-band keepers. Naturally the answer may depend on the time of year, the age of the snake, and the gender. If the cages are setup with a temperature range, a single gradient can accommodate males and females, young and old, spring through fall.

In general, hatchlings can be maintained year-round at the same temperature. I have great success with a range of 78-83°F. Hatchlings don't need to be cooler at night, and also don't need to be hibernated. Yearling and juveniles (2 year olds, and non-breeding three year olds), can be kept at the same range.

Breeding adults are kept a little warmer, letting the hot spot reach 86°F. Temperature range for breeding adults is 78-86°F. The wider

range is possible because they are housed in blanket boxes, while the rest are in shoebox and sweaterboxes. Higher temperatures are especially important for breeders immediately out of hibernation. Gray-banded kings, particularly males, are prone to respiratory ailments of varying severity, from mild sneezing noises, to full-blown pneumonia. It has been my experience that warming the snakes up quickly out of hibernation, and letting them have a warmer hot-spot, tends to alleviate the respiratory problems. Once all the snakes are out of hibernation, feeding, and

appear healthy - with no signs of respiratory illness, then I lower the temperature range to 78-84°F. Maintain it through the breeding season, and into the fall. It is when the temperature drifts into the 88-90° range that snakes begin to migrate to the front of the cage, and you know it's getting too warm!

Those are the temperatures I keep my *alterna* at. Some would argue that's too warm, and risks having sterile males. Yet every time I try a lower temp., I end up with sick males. I can't disprove this worry, though, and I have never achieved 100% fertility in *alterna* eggs, so I guess the jury is still out.

One other suggestion: put a hidebox in both the front and back of the cage. Gray-bands are nocturnal and secretive, and will suffer overheating rather than moving to a cooler area with no hiding spot.

Hide-boxes are another favorite topic. Anything can be used, from an old milk-carton, to a naturalistic cave made of flattened rocks siliconed together. As long as they are kept clean, anything will work just fine. My favorite type is an inverted flower pot base with a hole in the top. The bases are plastic or clay. A hole can be made in the clay type by tapping in the middle of the inverted base with a nail. I like either type because they're cheap, easy to clean, stackable, and durable. There is something about the clay material that seems to appeal to *alterna*. I have had many different hatchlings I could not get to feed, suddenly start eating pinkies after placing a clay flowerpot base into their cage to replace a plastic hidebox.

Piece by piece we are constructing a gray-band habitat. The next piece of the puzzle is substrate, the material used on the floor of the cage. Over the years I have tried every different material I could find. Pine shavings were popular for a time, as was newspaper, astroturf, corrugated cardboard, corn cob pellets, mulch, compressed pine chips (Sani-chip), even shredded egg cartons. New products

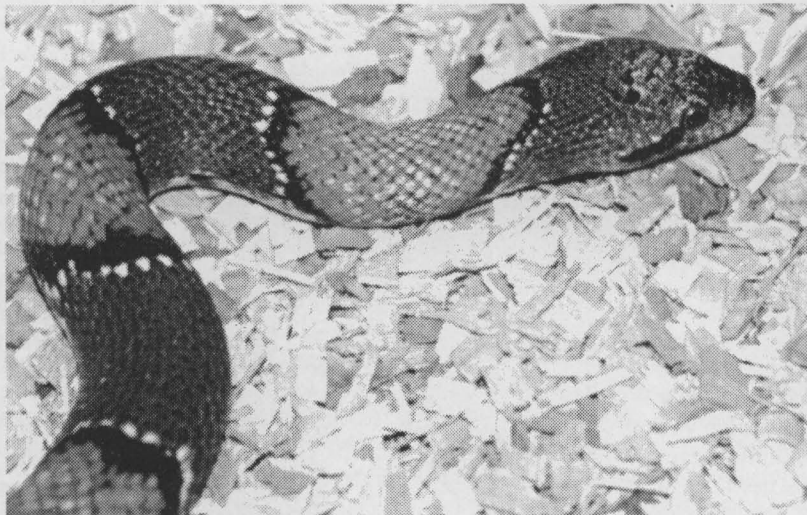


Fig. 3. Dark "Blair's" phase of *L. alterna*



are continuously appearing, and every type has its pluses and minuses. There is no perfect substrate.

Substrate should not injure the animal resting on it, and large amounts of dust may lead to respiratory illness. Particulate substrates may be ingested with possible intestinal obstruction. Nonabsorbent materials will expose the snake to waste material. In essence, the substrate should isolate waste material, give the snake a substance to use in locomotion, be visually appealing, cause no injury, and be economical. Remember, the cost of substrate adds up quickly if you're cleaning more than a few cages on a regular basis.

I currently use aspen bedding. Aspen substrate is composed of needlelike fragments compressed into a tight bale. It is relatively cheap, dust-free, and absorbent. Aspen flattens and molds into the bottom of the cage, and forms a mat. Gray-bands will burrow into it, and the aspen has enough structural integrity to allow tunnel formations. The possibility of ingestion causing problems exists, but I have never had any difficulties. Snake waste is absorbed into a clump, kind of like cat litter in a cat-box, and you can spot-clean the cage every day without having to do a complete change. Aspen is the overall preferred material.

Newspaper is the cheapest, but it really isn't absorbent, and its flat surface gives the snake no texture to gain a purchase on for movement. When the snake defecates, you need to completely change the material, many times a week. If you have the time to immediately change soiled cages, newspaper is probably the most absolutely hygienic, and is the second best material to use.

Sani-chip pine chips are okay but getting expensive, are not as absorbent, and I have lost an *alterna* after it ingested some of the chips. Corn cob pellets will mold, and create humidity problems.

Pre-cut pieces of corrugated cardboard are the best new substrate I have tried. Each piece has a roughened surface for aiding locomotion, and the material is absorbent, with zero dust. The trouble is, the pieces tend to curl on the edges in just a few days, and they also don't fit the larger rubbermaid boxes very well. A substrate isn't much good if the snake can crawl under it, and foul the bare floor. Over time, the pre-cut sheets can be expensive. In cages other than Rubbermaid boxes, however, I think they would work well.

Astroturf offers texture, no dust, durability, and visual appeal, but lacks absorbency, economy, and snakes still tend to root it up and crawl underneath. It is easy to clean, and with a stack of clean backup sheets, the soiled pieces can all be soaked together after the new clean sheets are in place. Pine shavings are too dusty, and can be ingested with unfortunate consequences. Mulch is expensive, leads to excess humidity, and I find it awkward to use. My bottom line on substrates is: dry, dust-free, absorbent, safe, and cheap.

Lighting of gray-bands doesn't seem to be an issue. No evidence exists to suggest it's necessary for health or breeding, and I have bred *alterna* for years with nothing more than the lights in the ceiling of my snake room. If I could afford it, though, I would like to have a fluorescent light in each of my cages. The light really seems to bring out the color; talk about visually appealing!

At the time of hibernation, I turn off all room light, and leave the snakes in total darkness for three months. It is more important to withhold light than it is to provide it.

All year long, including the winter hibernation months, each cage is provided with a small, heavy water dish. I prefer the plastic crock

style, and I don't like large dishes. I don't want my *alterna* curling up inside the water bowl. Put the water dish on the cool side of the cage, away from the heat-tape, or the water will evaporate quickly: not only will this require constant refilling, but it may also lead to too much humidity. Don't have lids on the water bowl, like cutting a hole in the lid of a plastic margarine container and using it as a water dish. A snake can drown in one of these lidded containers—it has happened.

Sometimes a problem feeder can be induced to feed by depriving it of water for 3 or 4 days, and then offering it a small fuzzy or pinkie dipped in water. Place the mouse next to the snake's head, with droplets of water covering the mouse. Many times the snake will start drinking the water drops, and end up eating the mouse. I don't know if the water gets flavored with mouse, but it is a technique that has worked many times.

Setting up a cage with the proper temperature, substrate, hidebox, and water-dish is an obvious and important first step. Selecting a healthy gray-band, and getting it settled and secure in its new home is vital but it will all be for naught if you fail to keep everything clean and neat. And even though some substrates allow spot-cleaning, it isn't enough to just scoop out the waste. Every cage ought to be completely cleaned, and disinfected, at least every other week. Cleanliness isn't just important for the snakes' health, but for the health of everyone living in close proximity to them.

Don't keep cages and accessories scattered around the house. Put the animals and the paraphernalia in one place. Put the materials infrequently used into storage containers (guess what? Rubbermaid boxes also seem to work as storage boxes too!). Treat your reptile area like a laboratory, because whether we like it or not, snakes and other reptiles do carry *Salmonella* bacteria. Ideally, the snakes should have their own closed room. Wear disposable latex gloves whenever you are in the snake room. During cleaning, don't use a sink or faucet in the kitchen, and don't use the dishwasher. Clean the entire cage, water dish, and hidebox with a bactericidal disinfectant. Keep the snakes out of the kitchen, and keep the kitchen out of the snake room! Take the soiled cage litter, and other garbage outside. When finished, wash your hands carefully in soap and water. All of this sounds extreme, but with the growing public awareness and uneasiness about reptiles and *Salmonella*, we owe it to ourselves and those already against us, not to provide any further ammunition. Ask any snake breeder, and they will agree. We need to display a professional competence before our friendly Feds decide what's best for us. I speak from personal experience here. My 8 month old daughter developed diarrhea, and a culture was positive for *Salmonella arizona*, an organism usually found in cold-blooded animals. How she got the bacteria is beyond me—I follow all of the precautions mentioned above. It just emphasizes the obvious—be careful!

*Salmonella* may have all the press, but I am worried about the possibility of a gray-banded kingsnake breeder contracting Hanta virus. If you will recall, this virus produces an aggressive and often fatal respiratory disease. The virus is harbored in wild rodents, especially mice. Most of the cases have been in the American southwest. In the past, I have used wild caught mice to entice finicky *alterna* to feed. Until more is known about this latest threat to our existence, avoid wild mice.

(to be continued)

## Book Review:

### SNAKES OF UTAH

by Douglas C. Cox and Wilmer W. Tanner Monte L. Bean Life Science Museum Brigham Young University Press, Provo UT 92 pp.  
ISBN 0-8425-2331-6 \$17.95 (+shipping)

Manny Rubio ©1996

It has been over 65 years since anyone has published a comprehensive work on the herpetofauna of Utah (Woodbury, 1931, Tanner, 1931). During this time numerous studies have been made on a diversity of the state's amphibians and reptiles. Unfortunately, many of the results were unpublished M.S. and Ph.D. theses, or were printed in a journals with limited distribution. *A Field Guide to Western Amphibians and Reptiles* (Stebbins, 1966, 1985) and its predecessor *Amphibians and Reptiles of Western North America* (Stebbins, 1954) contributed an excellent overview of the region, and *Handbook of Snakes of the United States and Canada* (Wright and Wright, 1957) and *Snakes of the American West* (Shaw and Campbell, 1974) treated the snake taxa similarly. Persons with a perfunctory interest will find this colorful little book, *Snakes of Utah*, an adequate guide to the snakes they might encounter while out hiking or exploring. However, avocational and professional herpetologists will be disappointed.

The cover design is simplistic, and bold. The title and authors last names, along with close-up photographs of a Desert Striped Whipsnake, *Masticophis taeniatus taeniatus*, and a Great Basin Rattlesnake, *Crotalus viridis lutosus*, stand out prominently from the stark white background. The block typeface and choice of differing bright colors for each letter of the word "snakes" although eye-catching, give the impression that this is a children's book. In fact, the entire layout of the book maintains this clean, albeit puerile style. I find the design/layout of the words beginning each section annoying to the point of being amusing. They are best compared to an ophthalmologist's eye chart. Starting in a large point size and descend with each of six lines to that which is normal for the body of text. There is a minimum of text, and oversized margins. If the design was not so lavish, and space was employed more judiciously, the book could have been half its size. But, then it would have been a booklet!

There are nine short sections to the book, three are single pages: *Glossary*, *Index* and *Acknowledgments*. The *Introduction*, like most of the text, is well presented, succinct, and factual. It offers: the derivation of the term snake, an explanation of the difference between snakes and lizards (a bit confusing) debunks some myths, explains the topography of Utah, discloses some general natural history about snakes inhabiting the state, and touches on common snake characteristics. This last item is slightly expanded in *Classification*. All of these points would have been better if more had been written about them. Though the authors attempt to be brief, omissions cause some facts to be misleading. As an example, they state: "Two groups, the vipers and pit vipers, have developed fangs in the front of the mouth." Although elapids are not indigenous to Utah (neither are vipers) they are indeed front-fanged snakes worthy of noting. A page of illustrations defining snake scutulation was lifted from the rear endpaper of Stebbins' Western field guide, without crediting the source.

The species accounts are cleverly divided into families by different color banners. All the sections are additionally separated by full page photographs of Utah habitat. One must assume that these poorly rendered images are included for that reason, there is no explanation or accompanying captions.

Each of the 33 species and subspecies of snakes found in Utah is presented on two opposing pages. The left is text with a map of the snake's range in the state, the right contains a photograph or two of the snake. One photograph is a portrait, the other shows its full body. A few are excellent, some are good, but nearly half are barely

adequate to enable identification of the animal. Since they are the primary method of identifying a specific snake, the quality of the photographs greatly inhibits the book's usefulness. There is no reason for including full body images of snakes that are totally unsharp, or so poorly exposed that the pattern is indiscernible. This is particularly annoying since it is likely that most inexperienced observers will be barely close enough to see more than the overall shape and pattern. Images of Utah Blind Snake, *Leptotyphlops humilis utahensis*, Regal Ringneck Snake, *Diadophis punctatus regalis*, Western Yellowbelly Racer, *Coluber constrictor mormon*, Mojave Patchnose Snake, *Salvadora hexalepis mojaviensis*, Desert Glossy Snake, *Arizona elegans erburnata*, and Upper Basin Garter Snake, *Thamnophis elegans vascotanneri*, are the worst offenders, but there are others.

The majority of photographs suffers from two problems inherent to the photographic technique employed. All of the snakes were photographed on a clear white background, most likely to enhance, simplify the design, and to be a more cost-effective method of reproduction. This style is reminiscent of amphibian and reptile images published around the turn of the century, and in Laurence Klauber's epic rattlesnake tome (Klauber, 1956). Generally, larger snakes fare well, but smaller or shinier ones do not. Aside from taxing the sharpness, contrast, and anti-refractive coating of the lens (causing an undesirable condition in the image known as flare or "bloom"), the white simply reflects from the shiny scale surface giving it a hazy, milky glaze. Frequently, the snake looks as though it is going into a shed (opaque).

At least three of the photographs are of dead/preserved snakes. If the attempt has been made to photograph only Utah specimens, I concede that it would be difficult to do, since many are uncommon or have a limited distribution in Utah; but not so in neighboring states. However, if that is the intent, the color morph of California King Snake, *Lampropeltis getula californiae*, is not the typical bright, contrasting, black and white desert phase common to Utah and neighboring Arizona and Nevada. The specimen shown is likely the southern California morph, distinctly more chocolate and yellow.

Since Smooth Green Snake is assigned *Liocrophis vernalis*, a recently suggested but debated taxonomic change (Oldham, J.C. and H.M. Smith, 1991), I assume it was an oversight to have retained *getulus* rather than the accepted *getula*. This does not explain the retention of Utah Blackhead Snake, *Tantilla planiceps utahensis*, currently *Tantilla hobartsmithi* (Cole and Hardy, 1981), or the retention of *Charina bottae utahensis* as a Rubber Boa subspecies, long considered invalid (Hoyer, 1970).

After the common and scientific names, each species account has two descriptive paragraphs. The first, *Recognition*, is a physical description with a very brief mention of its demeanor, reproduction, and feeding habits. *Occurrence in Utah* follows with macro and micro habitat, state and regional distribution, and associated habits. Although the range maps are not the preferred scatter-dot style, they are generally up-to-date and biogeographically oriented. However, there are questions here as well. The ranges and delineation within ranges of *Crotalus viridis* subspecies are arguable, and too abrupt and finite. In almost every region where subspecies juxtapose there is a wide area in which they intergrade. It appears the authors assume habitat preference, or some undisclosed criteria, are enough to prevent interbreeding. The photographs of Midget Faded Rattlesnake, *Crotalus viridis concolor*, and Hopi Rattlesnake, *Crotalus viridis nuntius*, demonstrate atypical specimens. If they are from Utah, I suggest they may be intergrades.



The range of Western Yellowbelly Racer, *Coluber constrictor mormon*, includes the extreme southwestern corner of Utah, the most arid part of the state, while the text clearly indicates, "This species is rather specific about its habitat and is not found in the dry parts of the state..." The authors suggest that Western Blackneck Garter Snake, *Thamnophis cyrtopsis cyrtopsis*, may exist along the Colorado River Drainage, but carefully avoid it in the range map. The taxon is found north of the river in Arches National Monument. (Bartholomew, pers. com., 1996).

Perhaps the greatest oversight is the absence of a bibliography. This book, like any colorful, state or regional field guide, is sure to whet the appetites of many budding naturalists. However, it merely opens a door, abandoning them with nowhere to go for more information.

The rear dust jacket proposes: "This book will be a valuable companion on backpacking trips, family outings, and camping or hiking trips, and will help students in all levels of school to learn about snakes." I find it most... that if this is the aim of this book, why is it overpriced? To permit wide circulation and availability to everyone, a more logical and fitting price would be \$9.95 rather than \$17.95.

Even with its shortcomings, Snakes of Utah will find a place on the shelves of many naturalists. Hopefully, the authors are planning a better edited, more comprehensive book on the herpetofauna of the spectacular and biologically diverse Beehive State.

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## Book Review:

### PRACTICAL ENCYCLOPEDIA OF KEEPING AND BREEDING TORTOISES AND FRESHWATER TURTLES

By A. C. Highfield. 1996. Carapace Press, London. 295 pp. Hardcover (ISBN 1-873943-11-3), \$59.95, paperback (ISBN 1-873943-06-7), \$47.95.

#### Stan Draper

I am really envious of people starting out today in the world of herpetoculture. The amount of printed material available to help them get and stay on track when taking care of their animals is mind-boggling. Of course there is the usual trash that has to be sorted out to find the really helpful texts. I am very delighted to say I have just finished one of the finer texts written recently.

A.C. Highfield's *Encyclopedia* is just that—a tremendous amount of information packed into an easy to read and use format. He starts the book with a chapter on the role of captive breeding. This is a highly debated topic. Whether or not captive breeding will or does really stop or deter the capture of wild specimens is a subject for another time. I do know that captive breeding has made many species that were formerly unavailable to the non-institutional person easier to obtain for private collections. Also included in this first chapter are discussions about physiological aspects such as age, dimorphism, size, and behavior.

Chapter Two contains just about everything a herpetoculturist needs to know about eggs and egg-laying. This also starts the dialogue about incubation. One of the most interesting facts that I had not known before was that both the breeding area and the nesting areas should not be totally flat; there should be some slope or undulation in the surface of the enclosure.

Incubator design, construction and use make up Chapter Three. Encompassed within this chapter's fifteen pages are the different types needed for the various species of chelonians, their controls and monitoring, how to handle the eggs and their possible problems and a short exchange on ESD (also known as TSD) – environmental

sex determination.

Naturally, next should be a chapter on hatching and neonatal care. Chapter Four is entirely that, from when and if to help a hatchling emerge, to the proper housing for the first months of life.

Environmental maintenance and duplication are the subjects covered by Chapter Five. Items covered vary from diurnal cycles of heat and light to humidity and hibernation. All of the diverse environments are covered including the different types of aquatic habitats.

Aquatic and semiaquatic species maintenance is the totality of Chapter Six. The myriad of enclosures is covered very thoroughly from construction to filtering. Now I really do know why the people who keep aquatic and semiaquatic turtles have to be so devoted.

Chapter Seven is titled "Dietary Management and Nutritional Disorders." The chapter quite successfully covers vitamins and minerals and even trace elements needed by the well kept chelonian. It also covers what to do to try and stop and reverse any disorders caused by dietary deficiencies.

Chapters Eight (parasitic) and Nine (bacterial & viral) cover the multitude of diseases seen by chelonian caretakers. The causes and cures are discussed at length and there are also color pictures of some of the more commonly seen afflictions in the central area of the text.

Part Two of this well priced reference consists of over one hundred pages of individual species accounts in alphabetical order. These accounts include general observations, taxonomy, description, captive environment, diet, common health problems and breeding.

If your species is not in here, you can still make inferences from closely related or similar species accounts.

Included in the back of the book are a concise glossary, a table of dietary constituents and additives, several addresses of European and American societies and a wonderful bibliography which is arranged by genus and subject matter making it simple to find the material you need without reading every entry.

The illustrations and color photos are very well done and well placed in the text. I could go on praising this book, but you would probably think that I was making a profit from its sales. The couple of minor mistakes I found are just that—minor.

Whatever you have to do to buy this book, do it!!! You will not regret one red cent.

### **Classified Ads:**

**For Sale:** 1.1 Everglades ratsnake, proven breeders, 1 clutch this year will lay another, \$200/pr. 1.2 Desert rosy boas (*gracia*), one female has had babies before, \$375/trio. 0.1 Coastal rosy boa (*roseofusca*) wild caught, \$150. 1.1 red-tail boa (*imperator*) male 6' with lots of peach, female 7-8' darker, both tame \$500/pr. 1.0 Blond Transpecos rat snake (*Bogertophis subocularis*) eats rat pups. 1/8" of tail tip missing, \$200. Willing to negotiate. Call Stan, (801) 364-5009.

**Honduras Natural History Exploration** - September, '96, Kenya Herpers Safari - October, '96, Trinidad Exploration - December, '96; Cold-Blooded Australians - January, '97; Herps of Israel - May, '97; & more. Brochures & Information: Herp Quest (619) 630-3058 Fax (619) 631-3802.

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**AMERICAN FEDERATION OF HERPETOCULTURISTS.** A non-profit national membership organization of herpetoculturists, veterinarians, academicians, and zoo personnel involved in the captive husbandry and propagation of amphibians and reptiles. Membership includes the highly acclaimed *The Vivarium* magazine, dedicated to the dissemination of information on herpetocultural accomplishments, herpetological medicine, breeding & maintenance, field studies and adventures, enclosure design and much more. Membership in the AFH is \$28.00. Send information requests to, AFH-News, PO Box 300067, Escondido, CA 92030-0067.

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**No meeting scheduled this month**